Brotherhood of St Laurence
Working for an Australia free of poverty

RESEARCH SUMMARY

In-home temperature monitoring

Climate Safe Homes

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Climate Safe Homes was a pilot run by the Brotherhood of St. Laurence (BSL). It aimed to address the interconnected factors of poor health, poor housing and energy-related hardship that affect the health and wellbeing of people with temperature-impacted health conditions living with a low income. Climate Safe Homes provided subsidised energy efficiency upgrades to 126 homes, including solar, reverse-cycle air-conditioning (RCAC) and insulation.

Indoor temperature monitoring was conducted in the homes of 10 participants following their participation in the pilot, to assess the temperature differences between upgraded and non-upgraded rooms in the home.

Key points

Temperature monitoring conducted in homes upgraded through Climate Safe Homes found the pilot successfully supported households to improve indoor temperatures to better manage their health.

It found rooms with RCAC upgrades provided better thermal comfort than those without. This included lower mean (average) and maximum summer temperatures and a greater period within the World Health Organization (WHO) healthy temperature range (18–24°C) than non-upgraded rooms.

Non-upgraded rooms provided poorer thermal comfort. Most concerningly, at night, non-upgraded bedrooms were outside the healthy range 20% more than upgraded bedrooms on average.

Most participants also reported upgrades kept the room cool, more affordably, on very hot days. This decreased bill stress and supported them to better manage their health.

Background

Many people in Australia with poor health live in homes that are too cold in winter or too hot in summer. This can worsen existing medical conditions and increases the risk of illness or death. Those most at risk include older people, young children, and individuals with chronic health conditions or disability – groups that are overrepresented in households with low income.

Poor housing quality – such as inadequate insulation, inefficient or unsafe heating and cooling systems – and high upgrade costs further undermine health and make it difficult for households to maintain safe indoor temperatures.

Many households also experience energy-related hardship, either by being forced to use too little energy (to save money at the expense of health), paying unaffordable bills or cutting other essential costs to afford energy. These issues often overlap with chronic illness or disability, which can reduce income and increase time spent at home in poor conditions.

Climate Safe Homes helped households undertake energy upgrades that improved indoor temperatures, reduced energy bills and lowered CO_2 emissions – to enhance both health and climate resilience.

The pilot delivered 148 upgrades in 126 homes including:

- 74 reverse-cycle air-conditioners
- 67 solar upgrades
- 7 insulation upgrades.

The average cost of upgrades per home was $7,370 and for every $1 of philanthropic subsidy funding, CSH

leveraged an additional $2.74, resulting in a total impact of $3.74 per dollar.

Temperature monitoring

Temperature monitoring was conducted in 10 homes post-participation in the Climate Safe Homes pilot.

Onset brand data loggers were installed in a 'treatment' and a 'non-treatment' room of the home. In summer, from 1 December 2025 to 28 February 2026, the devices logged the temperature every 30 minutes.

Treatment rooms are those where RCAC was installed, or a room with pre-existing RCAC where solar had been installed to offset the running costs of keeping that room cool. Non-treatment rooms did not have RCAC.

The data[1] was analysed to evaluate thermal comfort, time within recommended temperature bands, daytime/nighttime performance and summer temperature characteristics. This was done to understand whether treatment rooms (main living areas and participant bedrooms) provided more comfortable thermal environments than non-treatment rooms.

Findings

Treatment rooms provide better overall thermal comfort

Treatment rooms remained within 18–24°C from 57 to 90% of the time compared to 34% to 80% of the time for non-treatment rooms.

Upgraded main living areas remained within the WHO healthy temperature range on average for 66% of the daytime (Table 1). The range was between 51% to 95%.

Table 1: Daytime (9am to 9pm) within 18–24°C

Room type	Mean %
Treatment MLAs* (n=8)	66%
Non-treatment other rooms (n=5)	59%

* MLA = main living area

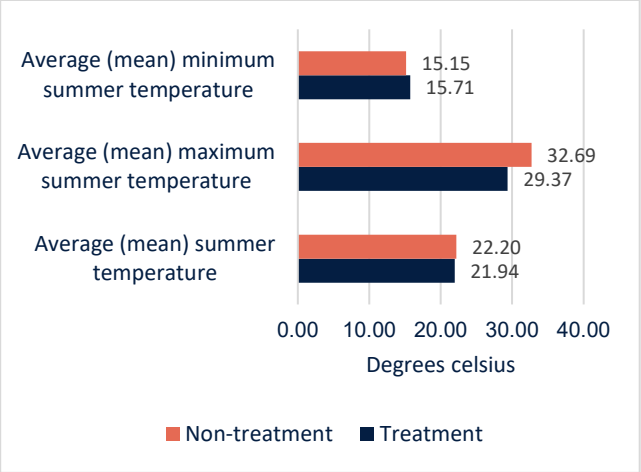
Upgraded bedrooms remained within the WHO healthy temperature range on average 89% of the nighttime. By contrast, non-upgraded bedrooms were only within the healthy range 69% of the nighttime on average.

Table 2: Nighttime (9pm to 9am) per cent of time within 18–24°C

Room type	Nighttime %
Treatment PPT bedroom 1	83%
Treatment PPT bedroom 2	94%
Non-treatment PPT bedroom 1	50%
Non-treatment PPT bedroom 2	65%
Non-treatment PPT bedroom 3	69%
Non-treatment PPT bedroom 4	73%
Non-treatment PPT bedroom 5	87%

Treatment rooms maintained healthier temperatures than non-treatment rooms. This included lower mean and maximum temperatures and higher minimum temperatures across both day and night times, as demonstrated in Figure 1.

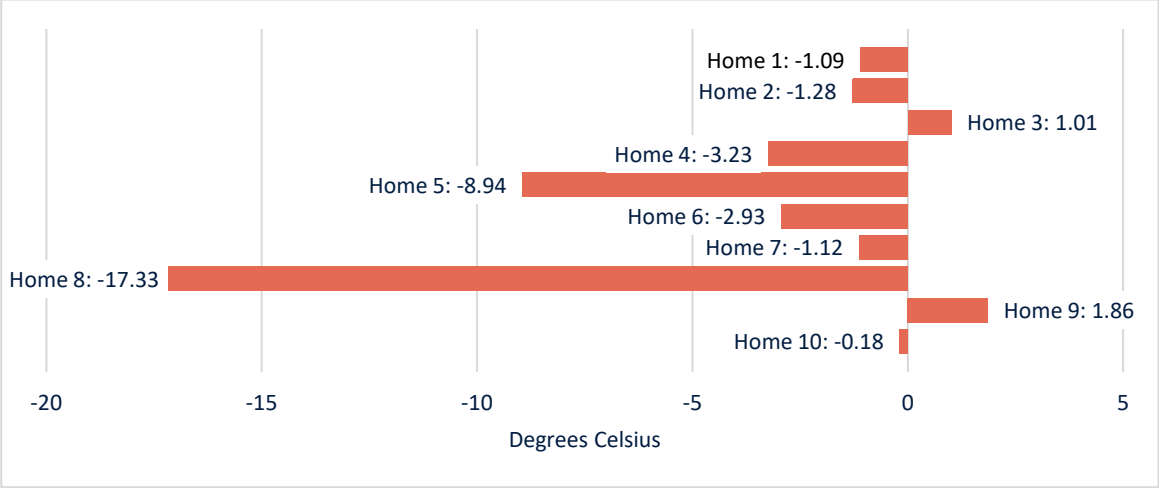
Figure 1: Internal temperatures in summer (mean)



While most treatment rooms were cooler in summer than non-treatment rooms, two exceptions were observed and maximum temperatures varied widely across rooms. In Figure 2 each bar represents the difference between a treatment room and non-treatment room in one house, demonstrating the wide range of difference in indoor temperatures between participating households.

[1] Limitations to the data: missing data in three homes, additional insulation and effects of RCAC 'leakage' into three non-treatment rooms.

Figure 2: Difference in maximum summer temperature – treatment rooms compared to non-treatment rooms



Participants reported the upgrades were effective

Participants reported the upgrades supported improved temperatures in the home and better health and wellbeing, including:

- 100% reported the upgrades were effective in keeping the treatment room cool on very hot days
- 80% of participants reported less or less severe symptoms of their temperature-sensitive health condition.

Sally* in Heidelberg, who manages a health condition that is impacted by both hot and cold conditions, explained, 'Climate Safe Homes has been a game changer for me and my health, allowing me to reduce symptoms and increase my comfort in my home.'

And Louise* in Narre Warren, who installed solar panels, and RCAC in her bedroom shared, 'Having the solar panels installed has been a life saver. Not only can I use my air-conditioning more frequently – I am not stressing about the cost.'

Some households still face barriers to maintaining healthy indoor temperatures

Qualitative data collected from householders identified that while the upgrades had provided important capacity, six of the households reported barriers to maintaining healthy indoor temperatures. These included:

- a lack of RCAC in other rooms
- unwillingness to open windows at night due to security concerns
- concerns that existing RCAC would be expensive to run.

Conclusion

Energy efficiency upgrades in the homes of people living with a temperature-impacted chronic health condition or disability and a low income can improve indoor temperatures, bring down energy bills and reduce carbon emissions while supporting households to be more resilient to climate change.

The findings of this temperature monitoring research demonstrate that efficient electric (reverse-cycle) air-conditioning can support households to improve indoor temperatures to manage their health. Offsetting air-conditioning running costs with solar can also bring down bills and increase householder's confidence to use the air-conditioning they need to support their health.

The Climate Safe Homes pilot has shown that provision of a modest subsidy, combined with tailored navigation support and access to trustworthy suppliers, can enable energy efficiency upgrades in these homes. Further research to better understand program impacts could include pre- and post-upgrade temperature monitoring with a larger sample. Delivery of a similar program by local or state government would provide an opportunity to assess these impacts at scale.

About the project

This research was conducted as part of the Climate Safe Homes pilot. The pilot was funded by the Lord Mayor's Charitable Fund (now Greater Melbourne Fund) and the Schneider Electric Foundation.

For further information

A report on the broader findings of the Climate Safe Home pilot can be found at: https://www.bsl.org.au/research/our-research-and-policy-work/projects/climate-safe-homes-research/

For other relevant BSL publications see <https://www.bsl.org.au/research/publications/>.

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*Pseudonyms have been used to protect participant privacy.